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REMARKS

Claims 1-13 are all of the claims presently pending in the application. Claim 3 has been amended by the present Amendment.

Entry of this Amendment is believed proper since no issues are being presented to the Examiner, which would require further search and/or consideration.

As a preliminary matter, in the Office Action dated March 17, 2005, the Examiner stated that "Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action" (see Office Action dated March 17, 2005 at page 6, numbered paragraph 8). Applicants respectfully submit that independent claim 1 (which is rejected under a new ground of rejection) was not substantively amended in Applicants' previous Amendment filed on January 27, 2005. Therefore, Applicants Amendment clearly did not necessitate the Examiner's new ground of rejection. Accordingly, Applicants filed a Petition to Withdraw Finality of Rejection as Premature on April 17, 2005.

Claims 1, 2, 4, 5, 7 and 12 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Kashima et al. (U.S. Patent No. 4,163,000) (hereinafter "Kashima"). Claims 3, 6 and 8 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Kashima in view of Sutton et al. (U.S. Patent No. 5,735,334) (hereinafter "Sutton"). Claims 1, 9-11 and 13 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Sutton in view of George et al. (U.S. Patent No. 3,749,151) (hereinafter "George").

These rejections are respectfully traversed in the following discussion.

I. THE CLAIMED INVENTION

The claimed invention (e.g., as defined by claim 1) is directed to a method of casting aluminum or aluminum alloy including producing a sand mold, injecting at least one of molten aluminum and molten aluminum alloy into the sand mold, cooling a casting thus obtained together with the sand mold by at least one of water and a liquid coolant, and dismantling the sand mold.

The claimed invention of exemplary claim 1, provides a method of casting aluminum or aluminum alloy including producing a sand mold, injecting at least one of molten aluminum and molten aluminum alloy into the sand mold, and cooling a casting thus obtained together with the sand mold by at least one of water and a liquid coolant (e.g., see Application at page 2, line 27 through page 3, line 4).

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II. THE PRIOR ART REFERENCES

A. The Rejection of Claims 1, 2, 4, 5, 7 and 12

The Examiner alleges that Kashima teaches the claimed invention of claims 1, 2, 4, 5, 7 and 12. Applicants submit, however, that there are elements of the claimed invention which are neither taught nor suggested by Kashima.

That is, Kashima does not teach or suggest *"cooling a casting thus obtained together with the sand mold by at least one of water and a liquid coolant"* as recited in claim 1.

The Examiner attempts to rely on column 7, lines 62-69 and column 9, lines 25-31 of Kashima to support his allegations. The Examiner, however, is clearly incorrect.

That is, nowhere in these passages (nor anywhere else for that matter) does Kashima teach or suggest cooling a casting thus obtained together with the sand mold by at least one of water and a liquid coolant. Indeed, Kashima does not even mention the manner in which the casting and/or the mold is cooled, let alone teach or suggest that the casting is cooled together with the mold by at least one of water and liquid coolant.

Kashima merely states that molten iron is poured into the mold and then cooled. Kashima does not mention how the molten iron is cooled, let alone teach or suggest that it is cooled with water or a liquid coolant as alleged by the Examiner.

Furthermore, Kashima does not teach or suggest that the molten iron is cooled with the mold. Kashima merely teaches that the mold is dipped in water after cooling, to disintegrate the mold to give the casting a smooth surface. The mold is not cooled by the water. Kashima clearly states the mold is not dipped into the water until after it is already cooled.

In the Response to Arguments section of the Office Action dated March 17, 2005, the Examiner alleges that "Applicant claims the method of casting 'comprising' of a cooling step. In Kashima, there exist two cooling steps. First, the metal and mold is cooled (not mentioned by what cooling means) and the second step being 'dipped in water'. Dipping in water serves the function of disintegrating the sand mold as well as cooling the sand mold and the cast product" (see Office Action dated March 17, 2005 at page 6). Applicants respectfully disagree with the Examiner's assertion.

That is, there is no disclosure or teaching anywhere in Kashima to support the Examiner's assertion that there are two cooling steps. Applicants respectfully submit that the Examiner must consider the plain meaning of the disclosure of Kashima. Kashima merely

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teaches one cooling step. Kashima additionally teaches a mold disintegration step subsequent to the one cooling step. Nowhere does Kashima teach or suggest a second cooling step as alleged by the Examiner.

That is, nowhere does Kashima teach or suggest that “[d]ipping in water servers the function of disintegrating the sand mold as well as cooling the sand mold and the cast product” as alleged by the Examiner. Indeed, Kashima clearly states “[w]hen the mold was dipped in water after cooling, it readily disintegrated to give a casting having a smooth surface” (see Kashima at column 9, lines 25-31). If the Examiner wishes to maintain this rejection Applicants respectfully request the Examiner to specifically point out where Kashima teaches or suggests that dipping the mold in water further cools the already cooled mold.

Moreover, nowhere does Kashima teach or suggest that “*a temperature of the casting prior to the cooling is immediately above a solidus temperature of the casting*” as recited in exemplary dependent claims 7 and 8.

Therefore, Applicants submit that there are elements of the claimed invention that are not taught or suggest by Kashima. Therefore, the Examiner is respectfully requested to withdraw this rejection.

B. The Rejection of Claims 3, 6 and 8

The Examiner alleges that Sutton would have been combined with Kashima to form the claimed invention of claims 3, 6 and 8. Applicants submit, however, that these references would not have been combined and even if combined, the combination would not teach or suggest each and every element of the claimed invention.

That is, these references are directed to different problems and solutions. Specifically, Sutton is directed to increasing the rate at which casting may be made, whereas Kashima is merely directed to a foundry mold composition having various advantages including freedom from environmental pollution. Therefore, these references are completely unrelated, and no person of ordinary skill in the art would have considered combining these disparate references, absent impermissible hindsight.

Furthermore, the Examiner’s motivation to modify Kashima (“to increase production rate”) does not appear to be a problem in Kashima that would require a solution. Thus, as pointed out in MPEP 2143.01, the Examiner’s motivation is “improper”. “The mere fact that

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references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination" (emphasis added by Applicants). Here, the prior art does not suggest the Examiner's urged desirability of the combination.

Moreover, neither Sutton, nor Kashima, nor any combination thereof teaches or suggests *"cooling each unit sand mold by dipping each unit sand mold into at least one of water and a liquid coolant"* as recited in claim 3.

The Examiner attempts to rely on column 2, lines 14-30 and column 3, lines 36-54 to support his allegations. The Examiner, however, is clearly incorrect.

That is, nowhere in these passages, nor anywhere else for that matter does Sutton teach or suggest cooling a casting thus obtained together with the sand mold by at least one of water and a liquid coolant. Indeed, the Examiner does not even allege that Sutton teaches or suggests this feature. In fact, the Examiner merely relies upon Sutton as teaching the steps of producing a unit sand mold within a mold making chamber on a casting line for the purpose of increasing the rate of production. Therefore, Sutton fails to make up for the deficiencies of Kashima.

Therefore, Applicants submit that the cited references would not have been combined as alleged by the Examiner, and that even combined, the combination of Kashima and Sutton would not teach or suggest each and every element of the claimed invention. Therefore, the Examiner is respectfully requested to withdraw this rejection.

C. The Rejection of Claims 1, 9-11 and 13

The Examiner alleges that George would have been combined with Sutton to form the claimed invention of claims 1, 9-11 and 13. Applicants submit, however, that these references would not have been combined and even if combined, the combination would not teach or suggest each and every element of the claimed invention.

That is, the Examiner's motivation to modify Sutton ("to facilitate removal of the casting") does not appear to be a problem in Sutton that would require a solution. Thus, as pointed out in MPEP 2143.01, the Examiner's motivation is "improper". "The mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination" (emphasis added by Applicants). Here, the prior art does not suggest the Examiner's urged desirability of the

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combination.

Moreover, neither Sutton, nor George, nor any combination thereof teaches or suggest *"cooling a casting thus obtained together with the sand mold by at least one of water and a liquid coolant"* as recited in claim 1.

The Examiner attempts to rely on column 5, lines 43-44 of Sutton to support his allegations. The Examiner, however, is clearly incorrect.

That is, nowhere in these passages, nor anywhere else for that matter does Sutton teach or suggest cooling a casting thus obtained together with the sand mold by at least one of water and a liquid coolant. Indeed, Sutton merely teaches providing a chilling plate for forming a plug in an inlet portion of a mold.

That is, Sutton teaches filling a mould (31) with molten metal. The mould (31) includes a cavity (33), for holding/casting the molten metal, and an inclined metal runner (35) extending from the cavity (33) to a mould inlet (36) (see Sutton at column 4, lines 33-50).

Sutton teaches that after the mould is filled, the mould runner (35) is sealed against a chill plate (40), which freezes a portion of the metal in the mould runner (35) to act as a plug. Nowhere, however, does Sutton teach or suggest that the chill plate (40) cools the casting together with the sand mold. Alternatively, Sutton teaches that after filling the mould, it is necessary to provide a dwell time for the metal to solidify. Nowhere, however, does Sutton teach or suggest that water is used to cool the metal during the dwell time.

Moreover, nowhere does George teach or suggest cooling a casting thus obtained together with the sand mold by at least one of water and a liquid coolant. Indeed, the Examiner does not even allege that George teaches or suggests this feature. George merely discloses a vibrating means for the purpose of facilitating the piercing of a mold. Therefore, George fails to make up for the deficiencies of Sutton.

Therefore, Applicants submit that the cited references would not have been combined as alleged by the Examiner, and that even combined, the combination of George and Sutton would not teach or suggest each and every element of the claimed invention. Therefore, the Examiner is respectfully requested to withdraw this rejection.

III. FORMAL MATTERS AND CONCLUSION

In view of the foregoing, Applicants submit that claims 1-13, all of the claims presently pending in the application, are patentably distinct over the prior art of record and are

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in condition for allowance. The Examiner is respectfully requested to pass the above application to issue at the earliest possible time.

Should the Examiner find the application to be other than in condition for allowance, the Examiner is requested to contact the undersigned at the local telephone number listed below to discuss any other changes deemed necessary in a telephonic or personal interview.

The Commissioner is hereby authorized to charge any deficiency in fees or to credit any overpayment in fees to Attorney's Deposit Account No. 50-0481.

Date: July 17, 2005

Respectfully Submitted,



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I hereby certify that I am filing this paper via facsimile, to Group Art Unit 1725, at (703) 872-9306, on June 17, 2005.

Date: July 17, 2005

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